**AP Biology Final Project - Endangered Species Profile**

**Description:** All students will be responsible for choosing an endangered species in the United States and completing a profile which includes summaries about the organism's ecology, evolution, conservation and physiology. It will also include a summary of a peer-review journal article about the endangered species. Students who are required to complete the final exam (those with below an A average) will be responsible for one additional component, which is a screencast/video presentation. Each component is outlined below and an associated grading rubric follows. Helpful and reliable resources for each component are also provided.

**Component #1 - Ecology Summary:** This component includes both written and diagrammatic information about the age structure, fecundity and survivorship of the species. Additionally, the niche of the organism should be described including its spot in the food web as well as any symbiotic relationships that it participated in.

**Component #2 - Evolution Summary:** Students will using the NCBI BLAST computer database to determine the three most closely related species and create a cladogram based on this information. Additionally, physiological and behavioral adaptations that have occur within this population will be discussed. Finally, the classification of the organism, through all seven levels (beginning with kingdom and ending with species), will be determined for the organism.

**Component #3 - Conservation Summary:**

Students will explore current species conservation efforts put into place by government agencies or other organizations. They will describe at least three key actions included in these current conservation efforts and justify why these actions will benefit their chosen endangered species. They will then suggest an additional future conservation action. They will justify this suggestion.

**Component #4 - Physiology Summary:** Students will investigate the structure and function of two major organ systems within their endangered species and communicate their findings in a written report. For each organ system, students will identify two organs or smaller body parts within the organ system. Students will describe structural aspects of these organs or smaller body parts such as shape, molecular composition, etc. They will then explain how these structural aspects contribute to the function of the organs or smaller body parts.

**Component #5 - Summary of Government Report or Scientific Journal Article:** Students will evaluate a government report or scientific journal article about their endangered species. Students will write a clear, thorough, and accurate summary of this report or article. They will also communicate the overall goal or purpose of the report or article. Finally, students will suggest areas for future research regarding their endangered species. They will explain how these future research efforts may result in improved conservation efforts for the species.

**Component #6 - Final Presentation:** In this portion of the project, students will create a video to inform the public about their chosen endangered species. This video can be a screencast. A screencast is a video that shows what is on your computer screen while recording audio with the computer microphone. Teachers will provide students with examples of programs to use to create these videos. In the video, students will introduce their species and provide information about its ecological interactions and evolutionary history. They will also describe and justify current and suggested future conservation efforts for the species. The video must be a maximum of 10 minutes in length. Students who have an “A” for their year average as of Friday, May 26th will not be required to complete this portion of the project.

**Component Rubrics**

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| **Component** | **Requirements/Details** | **Point Value** |
| #1 - Ecology Summary | -Must be typed | /1 |
| -At least 3 scientific sources that are cited in MLA format | /3 |
| -Written description about age structure and survivorship | /4 |
| -Include graph (either from a source or made by you) depicting the age structure of the population | /2 |
| -Written description of the organism’s niche | /3 |
| -Written description of the organism’s role in the food web including its trophic level | /3 |
| -Image (either from a source or made by you) depicting the food web in which the organism is involved | /2 |
| -Written explanation of one symbiotic relationship in which the organism is a part of | /2 |
| -Written description and explanation of two biotic and one abiotic factors that limit the growth of the population | /3 |
| #2 - Evolution Summary | -Must be typed | /1 |
| -At least 2 scientific sources that are cited in MLA format | /2 |
| -Written description and explanation for one anatomical adaptation | /4 |
| -Written description and explanation for one behavioral adaptation | /4 |
| -Written description of the organism’s classification beginning with kingdom and ending with species. | /2 |
| -Written explanation of the use of the NCBI BLAST to locate the three closest relatives | /2 |
| -Identify the three closest relatives by scientific name of your species and include BLAST results (screen shot acceptable) for each relative | /3 |
| -Create a cladogram (must be made by you) to show the relationship between your organism and its three closest relatives. | /3 |
| #3 – Conservation Summary | -Must be typed | /1 |
| -At least 2 scientific sources that are cited in MLA format | /2 |
| -Written description of three current conservation actions undertaken by government agencies or conservation organizations. | /3 |
| -Written justification of these current conservation actions. | /3 |
| -Written suggestion for an additional future conservation action. | /1 |
| Written justification of this suggestion. | /2 |
| #4 - Physiology Summary | -Must be typed | /1 |
| -At least two scientific sources are cited in MLA format. | /2 |
| -Written description of the function of two major body systems (ex: circulatory system or digestive system) | /2 |
| -Written description of the structure (might include shape, cellular composition, molecular composition, etc.) of two organs or smaller body parts within each body system you identified. | /4 |
| -Written description of the specific function of the two organs or smaller body parts you identified for each body system. | /4 |
| -Written explanation of how the structure of each organ or small body part enables it to perform its function effectively. | /4 |
| -Labeled image (either from a source or made by you) that accurately depicts the internal and/or external anatomy of one organ or body part that you described. You must refer to at least three specific components of the image in your written description of the organ or smaller body part’s structure. | /2 |
| #5 - Summary of a Government Report or Scientific Journal Article | -Must be typed | /1 |
| -The government report or scientific journal article must be cited in MLA format. | /1 |
| -Written description of how you found the journal article (ex: through a government agency’s website or through an electronic database provided by the library). | /2 |
| -Written description of the goal of the report or article. | /1 |
| -Written summary of the data collected and conclusions drawn in the report or article. You may include up to three direct quotes (formatted correctly according to MLA standards) if you’d like to, but the rest of this summary must be in your own words. Each direct quote must not exceed two sentences in length. This written summary must be at least three paragraphs in length. | /5 |
| -Written suggestion for two areas of continued research that scientists could pursue with regard to this endangered species. Justify your suggestions by explaining how these areas of continued research could result in better conservation efforts for the species. | /4 |
| #6 - Final Presentation | -Clear statement of the purpose of the video. | /1 |
| -Introduction of the species using its common name, scientific name, an image, and where it lives in the United States. | /2 |
| -Explanation of at least two components of your ecology summary. | /4 |
| -Explanation of at least two components of your evolution summary. | /4 |
| -Description and justification of one current conservation action and your suggested future conservation action. | /4 |
| -The video is logically and purposefully organized. | /1 |
| -The audio is clear and understandable with little to no word stumbling or lengthy pauses. | /2 |
| -Visuals are included that support and enhance the ideas/concepts discussed in the audio | /2 |
| The video is a maximum of 10 minutes long. | /1 |

**Resources**

1. General Project Resources:
   1. <http://www.iucnredlist.org>
   2. <https://www.fws.gov/endangered/species/us-species.html>
   3. <http://animaldiversity.org/>
   4. <http://explorer.natureserve.org/index.htm>
   5. <https://ecos.fws.gov/ecp/>
2. Component #1 - Ecology Resources:
   1. <http://www.endangeredspeciesinternational.org/overview.html>
   2. http://endangeredanimalsexhibition.weebly.com/-effects-on-the-food-chain.html
3. Component #2 - Evolution Resources:
   1. <https://blast.ncbi.nlm.nih.gov/Blast.cgi>
   2. https://www.ncbi.nlm.nih.gov/nucleotide/
4. Component #3 - Conservation Resources:
   1. Sample Conservation Plans from Fish and Wildlife Services <https://www.fws.gov/endangered/species/recovery-plans.html>
   2. Sample Conservation Plans from NOAA Fisheries <http://www.nmfs.noaa.gov/pr/recovery/plans.htm>
5. Component #4 - Physiology Resources:
6. Our class textbook:

*Biology: The Unity & Diversity of Life* (2013) by Cecie Starr, Ralph Taggart, Christine Evers, and Lisa Starr.

1. Component #5 - Government Report/Scientific Journal Resources:
2. <http://animaldiversity.org/> (scroll down to sources listed at the bottom of the species profile)
3. <http://explorer.natureserve.org/index.htm> (look in the references section within the species profile)
4. <https://ecos.fws.gov/ecp/> (government reports are linked throughout the species profile)